

The relay that fails quietly is the expensive one.

Solid state relays that report their own state, for heated zones on machines you ship. Celduc, repped across NorCal and Northern Nevada by Dynamic.

THE PROBLEM

A solid state relay does not fail loudly. The zone stops heating, or the output stays closed and the zone drifts up, and the first anyone knows is downstream: a barrel that never came up to temperature, a batch that cooled wrong, a run of parts already boxed. The relay is almost never the cost. The cost is the hours of product made between the failure and the diagnosis.

WHY IT HIDES

The control system is answering a different question than the one that matters. The PLC knows whether it commanded the output on. It does not know whether current is flowing in the load. On a multi-element heater bank the gap is wider still: one element open in a bank of five is close to invisible to a loop that can still nearly hold setpoint.

HOW THESE DEVICES WEAR OUT

- The power stage opens. The load drops out and the zone stops heating.
- The output shorts. The load stays energized whether or not it was commanded.
- The opto-coupler degrades, so switching gets unreliable before it stops.
- Solder joints fatigue under thermal cycling, which is what a temperature loop does to a relay several times a minute for years.

CONSTRUCTION

Celduc connects the power stage with wire bonding on direct copper bonded substrate rather than the copper bridge most of this class uses. In the factory's thermal cycling work the wear out mode is an open bond, so the load drops out, where the bridge construction tends to fail shorted and leave the heater latched on. It is a reliability difference, not a rated safety function, so it does not replace an overtemperature cutout or a contactor in the safety chain.



Celduc solid state relays: single and three phase, 4A to 125A.

FEATURES

- Celduc manufactures relays and plug-on modules that report on their own state: mains status, load status, protection status, and output short circuit, with internal fault detection covering the opto-coupler, the thyristor and the solder joints.
- SOI relays build the current sensor into the output side, no external current transformer. A broken heating element drops the load current, the relay flags it, and the control system shuts the zone down.
- The ESUC module plugs onto the SU, SUL and SUM relays and monitors up to five heater loads for partial load break.
- The ECOM module carries a PID temperature controller, current monitoring up to 50A with a current transformer, and a communication interface, so the state reaches the control system instead of sitting on the panel door.

THE ENVELOPE

Single and three phase, 4A to 125A. Zero cross for AC-1 heating loads, random for AC-3 motor duty, AC-53a categories on the motor side. Working voltage comes from the specific part's datasheet, and we confirm it before it goes on a drawing.

WHERE THIS LINE STOPS

An SSR leaks in the off state. It is not isolation and it is not a disconnect: lockout, isolation and safety disconnect are a contactor, and that is Schaltbau. It is not a protective device either. It has no fault interruption and no standalone SCCR, and it wants semiconductor fuse coordination upstream; branch protection and disconnects are IMO. Above 125A in a single device, that is Schaltbau. And figure roughly one to one and a half watts dissipated per amp conducted: if there is no thermal budget left in the panel, an electromechanical contactor is the right answer and we will say so. Low-cycle simple on and off does not need an SSR at all.

NEW FROM CELDUC THIS YEAR

SMQR quad SSR. Four AC outputs in one relay, built for fast, long-life switching and a smaller control panel.

SOBR two-phase SSR. Push-in spring power terminals for faster, tool-free panel wiring.

SF548340 miniature SSR. 30A-class performance in about 30 percent of the space of a standard hockey puck relay.

New ranges roll out market by market; ask us where these stand for your build.

Dynamic Measurement and Control Solutions represents Celduc across Northern California and Northern Nevada. If you have a zone layout or a panel schedule coming together, send it over and we will tell you where a diagnostic relay earns its place and where a plain one is fine.